NavMed 369

UNITED STATES NAVY

MEDICAL NEWS LETTER

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Vol. 34 Friday, 3 July 1959 No. 1

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HISTORICAL FUND
of the
NAVY MEDICAL DEPARTMENT

A committee has been formed with representation from the Medical Corps, Dental Corps, Medical Service Corps, Nurse Corps, and Hospital Corps for the purpose of creating a fund to be used for the collection and maintenance of items of historical interest to the Medical Department. Such items will include, but will not be limited to, portraits, memorials, etc., designed to perpetuate the memory of distinguished members of the Navy Medical Department. These memorials will be displayed in the Bureau of Medicine and Surgery and at the National Naval Medical Center. Medical Department officers, active and inactive, are invited to make small contributions to the fund. It is emphasized that all donations must be on a strictly voluntary basis. Funds received will be deposited in a Washington, D. C. bank to the credit of the Navy Medical Department Historical Fund, and will be expended only as approved by the Committee or its successor and for the objectives stated.

It is anticipated that an historical committee will be organized at each of our medical activities. If you desire to contribute, please do so through your local historical committee or send your check direct, payable to Navy Medical Department Historical Fund, and mail to:

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Cyclotron Cataracts

In December 1948, it was discovered that five nuclear scientists who had been exposed to cyclotron irradiation had developed incipient lens opacities. Because it was known that the cyclotron produces fluxes high in fast neutrons and hard gamma rays, this observation immediately introduced the question of what role fast neutrons might play in the production of radiation cataracts.

Almost since the discovery of x-rays, it has been known that undue exposure to ionizing radiation frequently resulted in the late development of characteristic cataracts. It was then generally believed that comparatively large doses were necessary to produce these changes.

That there was a relatively high incidence of lens changes among the survivors of the atomic bombing of Hiroshima and Nagasaki, was known. Early observations indicated that the majority of the patients with cataracts had been within 3000 feet of the hypocenter. Later studies revealed that the greatest distance from the hypocenter at which lens damage could be definitely established was 3600 feet or 1.97 km. Because the amount of neutron irradiation at this distance was considered negligible, neutrons were not incriminated in these atom bomb radiation cataracts.

Also, in 1945 and 1946, it was known that 10 scientists had been the victims of an accidental exposure to cyclotron irradiation at the Los Alamos Scientific Laboratory. Two survivors later developed irradiation cataracts. In both, there was a definite latent period, the lenses being clear in 1949.

Therefore, while a great deal was known of x-ray cataracts, little was known of the role which neutrons might play in their production. In the light of the discovery of the lens opacities in the eyes of five scientists exposed to cyclotron irradiation and the probable high importance of lens changes in atomic bomb survivors, the Atomic Energy Commission enlisted the aid of the National Research Council in an investigation of cyclotron and atomic bomb radiation cataracts.

Various patients, all of whom were trained physicists, made every possible effort to estimate the type, amount, and the duration of their exposure to cyclotron irradiation. At the first examination, the family history of ocular and systemic disease, the past medical history, and the story of the present ocular difficulty were recorded. Each ophthalmic examination was complete and included examination of the external eye and adnexa, the ocular movements, pupillary reactions, ocular tension, visual fields, the ophthalmoscopic examination with dilated pupils, a detailed slit lamp examination, and a refraction examination with a record of the uncorrected and corrected vision. Each patient was individually examined by each member of the panel, and a group opinion was recorded with any additional comments from the individual examiners.

All lenticular changes which followed exposure to cyclotron radiation followed the same general pattern as do cataracts secondary to the gamma rays of radium or x-rays. There was a prolonged latent period between exposure of the eyes to the neutrons and the development of the lens opacities. In the 13 cases in this study, the minimum interval from the last exposure to neutrons to either a conscious visual failure or to the discovery of early lens opacities on routine examination, was one year; the maximum time between exposure and the development of cataracts was probably over 6 years. Because it is not known whether the lens damage was the result of one specific exposure to neutrons or to the cumulative amount received, it is impossible to fix the length of this latent period more exactly than from one to 6 years. On the average, the more severe the exposure, the shorter the latent period.

While the data available from this series of patients give only an approximate idea of the latent period between exposure to neutrons and the onset of lens changes, they do give a clear picture of the development of the resultant cataracts. The first changes occurred in the posterior, subcapsular cortex. These consisted of a few tiny whitish dots. In a few cases, there was no progression. In the progressive cases, these dots increased in number and size, and gradually assumed a rosette or disciform configuration between the posterior capsule and the nucleus of the lens.

In these early stages of development, it was specifically noted that the posterior capsule was not involved, a clear zone being visible between it and the opacities. In the later stages, as the opacities increased in size and density, they spread backward toward the posterior capsule which then could no longer be visualized.

Vacuoles in the lens were one of the first changes observed and their presence in large numbers was specifically noted in nearly all of the early cases. In the advanced cases which came to operation vacuoles were noted in only two of five patients. They were probably obscured or masked by the dense opacities. Visual failure was invariably due to the blocking of the pupillary space by the spread and increase in the density of the posterior opacities. In these cases, the lens clouding often appeared to mushroom forward from the depths of the posterior cortex and up to the posterior portion of the nucleus with a concavity on the anterior surface of the doughnutlike opacity.

Neutrons owe their cataractogenic action to the heavily ionizing irradiation which they produce in tissue. Because all types of ionizing irradiation produce the same qualitative tissue reaction, it is not surprising that the clinical symptomatology, latent period, and the threshold dose (allowing for the relative biologic effectiveness of fast neutrons and ordinary x-rays) should be approximately the same in both cyclotron and x-ray cataracts.

An analysis of the clinical records of 13 physicists, exposed to cyclotron irradiation between 1943 and 1946 and who received repeated ophthalmologic examinations between 1949 and 1957, permits the following conclusions:

1. The cataracts in these patients were identical with the usual irradiation cataracts occurring after exposure to gamma rays or x-rays, both in their morphology and in the latent period between exposure and the development of the incipient lens opacities.

2. Although the estimates of dose given by these patients are little more than educated guesses, they indicate that about 80 rads of fast neutrons is a cataractogenic dose producing visual impairment.

3. The greater the amount of cyclotron irradiation received, the shorter appears to be the latent period, the more intense the lens damage, and the more rapid the progression of the opacities.

4. The information derived from these records is insufficient to warrant any conclusions on the relation of duration of exposure to the cataractogenic effect of the irradiation or to the susceptibility of the juvenile lens as compared to the adult lens.

5. There is suggestive—but far from conclusive—evidence that cyclotron cataracts may be slightly poorer operative risks than ordinary senile cataracts.

6. There is nothing in these records which throws any light on the pathogenesis or mode of development of these cyclotron cataracts.

(Woods, A. C., Cyclotron Cataracts: Am. J. Ophth., 47: 20-27, May 1959)

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Multiple Antigen for Immunization

The desirability of combining poliomyelitis immunization with routine immunization of infants against diphtheria, tetanus, and pertussis has been recognized. Such a program, if generally adopted, would insure greater and more uniform protection against future outbreaks of poliomyelitis and would provide another advance in preventive medicine. The efficacy of diphtheria, pertussis, and tetanus antigens as a combined vaccine (DPT) in infants has already been shown and the need for protection of infants against polio has been reported and is becoming increasingly apparent. Killed trivalent polio vaccine evokes a response in infants and polio immunization of infants has been advocated.

To accomplish the objective of combined immunization of infants many clinicians have been starting polio inoculations at the time the diphtheria, tetanus, pertussis immunization is begun. By mixing the two vaccines (DPT and polio) just prior to administration, the same principle has been carried one step further. Reported animal studies have shown that antibody response can be effected by the administration of such mixtures. These procedures suffer, however, from one or more disadvantages. In the first procedure, combined immunization is accomplished by increasing the total injections

given. In the latter, such immunization is accomplished by the administration of a necessarily increased volume of the mixed vaccine with the attendant disadvantage of uncertainty concerning the stability and compatibility of the ingredients of such mixtures. The ideal solution would be a stable vaccine preparation containing in a small volume dose all the basic antigens in a concentration equal to that found in the individual vaccine. Once the numerous complex problems involved in achieving such an objective were resolved, three lots of Quadrigen used in this study (combined DPT-poliomyelitis vaccine, aluminum phosphate absorbed) were then prepared.

Antigen Component. The poliomyelitis virus antigens were from killed concentrates of trivalent poliovirus vaccine prepared by the formalin-ultraviolet irradiation procedure; diphtheria and tetanus were purified toxoids; and pertussis was an inactivated suspension of pertussis bacilli. The antigen components were concentrated so that, after combination, each 0.5 ml. contained a full immunizing dose according to minimum requirements established by the Division of Biologics Standards (DBS) of the National Institutes of Health for monovalent vaccines. Animal tests on the pertussis antigen, which went into the Quadrigen preparations used for the primary series of inoculations, showed that this antigen prior to combination had been a low potency. The pertussis antigens employed in the Quadrigen produced for experimental investigation have met or exceeded minimum requirements of the DBS. With the noted exception for the pertussis component in the first two vaccines, all of the components have also met or exceeded minimum DBS requirements when combined and tested in the Quadrigen preparations.

Preservative - Phemerol, 1:40,000 (recrystallized benzothonium chloride).

Mineral Carrier - The components were adsorbed on a Holt-type aluminum phosphate adjuvant so that a final concentration of 2-2.5 mg. of mineral carrier per 0.5 ml. would result.

Dosage - 0.5 ml. intramuscularly.

The subjects in this study were well children drawn from the regular child health clinics conducted by the Detroit Department of Health. They ranged in age from two and one-half months through 5 years. From 300 admitted to the study, 298 preprimary vaccination blood specimens were obtained and 224 children completed the three-dose schedule.

For this trial, it was decided to follow the DPT immunization schedule in regular use by the Health Department. Accordingly, the primary series consisted of three doses of vaccine (Quadrigen) at monthly intervals for the older children. Those under 6 months of age were given a fourth dose. The rationale for the fourth dose is predicated on the assumption that the immune response to antigens in the first 6 months of life might not be as adequate as the response in the second 6 months or later. Blood specimens were obtained at the time of each inoculation and 2 weeks after the final injection.

This new multiple antigen containing poliomyelitis vaccine combined with diphtheria and tetanus toxoids and pertussis vaccine induced a satisfactory antibody response to all antigen components when given to a group of children ranging in age from 2 months through 5 years. Children 6 months of age and older at the time of their initial dose were given a primary course of three monthly inoculations; the younger infants received four doses at monthly intervals. A booster dose of the quadruple vaccine was given about 18 months later.

The fourth dose given to the younger infants greatly improved their seroimmunological status and brought their antibody levels in line with those obtained in older children with only three doses. The booster dose of this multiple vaccine was found extraordinarily effective in enhancing the seroimmunological status of the children to all three types of poliovirus and to the bacterial components contained in the vaccine.

This uniformly high response to the booster dose occurred regardless of the age at which primary immunization was begun and regardless of the antibody level following the primary series.

The booster response was found to be a far more meaningful criterion for evaluating the effectiveness of the polio vaccine components than were serum antibody levels postprimary.

No clinical reactions of any serious consequence were reported or observed. (Barrett, C. D., Jr., et al., Multiple Antigen for Immunization Against Poliomyelitis, Diphtheria, Pertussis, and Tetanus. II. Response of Infants and Young Children to Primary Immunization and Eighteen-Month Booster: Am. J. Pub. Health, 49: 644-654, May 1959)

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Rheumatoid Arthritis Problems

Recent studies on rheumatoid arthritis have been concentrated in three fairly well defined areas—the clinical disease, tissues involved, and the serologic reactions observed. Each area has been intensively investigated in relationship to pathogenesis.

The clinical picture of the disease—its natural history and its epidemiology—has received a great deal of attention. These efforts on a clinical plane have been fraught with difficulties imposed by the elusive nature of rheumatoid arthritis. The disease, when far advanced, is apparent even to the novice, but in its early or minimal stage is difficult to recognize and to characterize even for the trained specialist. Diagnostic criteria have been proposed, but they have serious limitations. Criteria to appraise the rate and intensity of progression of the disorder have been suggested, but these also have defects. Individual patients have been noted who violate all criteria; the frequency

with which these patients are encountered has sorely tried the investigator who has chosen to work with rheumatoid arthritis. All dicta promulgated for assessing the (1) presence of the disease, (2) its severity, and (3) its expected course can be applied only to rheumatoid arthritis in general and not to the individual patient. Lastly, functional capacity correlates with severity of disease on a statistical but no more precise basis.

From these studies, certain broad generalizations may be made. Patients are more likely to have sustained disease if the manifestations of the disease are "typical" rather than "atypical"; or "classic" rather than "probable," according to the proposed diagnostic criteria with a positive serologic reaction for the rheumatoid factor rather than with a negative reaction; men do better than women. In population studies of patients with classic rheumatoid arthritis, i.e., those patients exhibiting positive "factor" reactions and x-ray changes, the sex incidence approaches 1:1 in contrast to the usual clinic population ratio of two to three females to one male. In such total population studies, patients with joint signs and symptoms (but not necessarily factor-positive or x-ray-positive) have a similar female preponderance.

The hereditary aspects of peripheral joint rheumatoid arthritis are not as clear-cut as they appear to be in the spinal variant, Marie-Strümpell spondylitis. Peripheral joint rheumatoid arthritis occasionally appears in twins and certain families have been encountered with a high prevalence of the disease. Most students of the disease believe that genetic factors probably play a role in peripheral joint rheumatoid arthritis, but one which will not be easy to document.

Assessment of therapy has been particularly difficult. An attempt is currently being made in this country to determine the possibility of employing modern methods of therapeutic evaluation in this disease with its characteristics of chronicity, unpredictable course, and end-points so difficult to appraise.

All-in-all, the relevant clinical studies of rheumatoid arthritis have been tedious and not too rewarding. Although a great mass of data has been accumulated from such studies, the authors have gained from them little solid knowledge of the cause of the disease.

The histopathology of rheumatoid arthritis may be called nondescript. In patients with unequivocal disease, the lesions are similar to scar tissue with an element of granulomatous inflammation. In early disease, the specificity of the lesion observed may be questioned. The rheumatoid nodule is considered to be the most characteristic visible lesion, but the distinction between the nodule of rheumatoid arthritis and that of rheumatic fever remains a matter of dispute; the fact that rheumatoid nodules appear in patients with unequivocal systemic lupus erythematosus tends to lessen the specificity of this so-called specific lesion. It has been proposed on the basis of limited direct evidence, as well as on inferential evidence, that the primary lesion

is an arteritis. But one or another form of arteritis may be encountered in a myriad of disorders and this view, even if correct, can therefore hardly lead to a closer delineation of mechanisms. It has suggested to some the possibility that the disease may be based on hypersensitivity. This train of thought has been fortified by the lack of conclusive evidence of a microbial etiology, by the sustained nature of the disease in many instances, and by the presence of the rheumatoid factor which, it has been suggested, may play the role of an antibody, particularly an autoantibody.

The disease affects the connective tissue widely and has loosely been called—with some justification because it involves this tissue primarily—a disease of the connective tissue. In the last decade, interest in this aspect of the problem has stimulated and led to the support of much work in this previously neglected area. A great deal has been learned about the connective tissue, its cells, amorphous ground substances, and fibrillar elements. It is hoped that in time an understanding of abnormal conditions will logically follow the work which has so far been done on the composition of normal components. Another aspect of the problem, i.e., the plasticity of this tissue, its genesis, differentiation, turnover, and the role it plays in vital processes, has been touched upon even in normal states only in the most superficial fashion. Suffice it to say that, as of now, little knowledge of the pathogenic mechanisms involved in rheumatoid arthritis has evolved from these truly great additions to our general biologic knowledge.

Thus, the ideas which have been followed have not, up to now, led to a clear-cut understanding of the pathogenesis of rheumatoid arthritis. The picture, however, is not all black. With the interest which has been aroused by each new development, new investigators have been attracted to the field and it is to be hoped that these new minds will continue to develop fresh approaches. Control of rheumatoid arthritis need not wait upon complete elucidation of the basic mechanisms involved. The demonstration that the process of rheumatic fever was initiated by infection with the Group A hemolytic streptococcus is an example. Antistreptococcal prophylaxis for the prevention of recurrent attacks of rheumatic fever has been eminently successful in curbing that disease, yet there is little more understanding of the subsequent stages of rheumatic fever following the initial streptococcal infection than of rheumatoid arthritis. More complete comprehension of the precipitating causes of rheumatoid arthritis, its initiation, and its ability to sustain itself might provide the means whereby the chain of progression of the pathologic process could be broken.

Further understanding of the clinical picture of the disease, its morbid pathology, the characteristics of the connective tissue or the role of the rheumatoid factor may possibly help to unravel the problem of the pathogenesis of rheumatoid arthritis.

Success would consist of ability to break the chain of progression of events which is known as the disease, "rheumatoid arthritis." Total success

would mean ability to prevent the inception of the disorder. (Ragan, C., Remarks on the Present State of the Rheumatoid Arthritis Problem: Am. J. Med., XXVI: 797-799, May 1959)

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Misuse of Antibacterials in Inguinal Herniorrhaphy

The development of antibiotic-resistant bacteria, which is one of the chief causes of hospital infections presently causing such grave concern, has been hastened by the unnecessary use of antibiotics in patients who have had no proved infection. Although frequent statements have been made deploring the use of antibiotics in such conditions, no reports have been published showing conclusively the extent to which antibiotics have been misused in a group of community hospitals in conditions for which these drugs clearly were not indicated.

This report compiles data for the first time which demonstrates the misuse of the antibacterials in inguinal herniorrhaphy—a very common condition which is an ideal test subject for the justification of the use of these drugs. There is nothing inherent in the repair of a simple inguinal hernia which requires or justifies the prophylactic use of antibacterials. The critique includes 1,536 procedures performed in 24 community hospitals located in seven states participating in the Medical Audit Program developed by the American College of Surgeons and the Commission on Professional and Hospital Activities. All hospitals were above the average in attempts to observe high standards of patient care and the evaluations of the patients were done by the medical staff of each hospital.

There was wide variation—from 100 to 9.2%—in the use of antibacterials as a routine part of treatment. Also, it was apparent that the larger hospitals, and those with intern and residency training programs, did not differ significantly from individual smaller hospitals in the percentage of patients who received antibacterials. One fact is significant: 38.2% of all patients who underwent simple inguinal herniorrhaphy received antibacterials at some time during hospitalization, and 84% of that group for prophylactic reasons. It is also of interest that only 52.2% of patients with complicated inguinal hernias received antibacterials.

Despite the fact that the recent literature indicates that the majority of strains of staphylococci now encountered in hospital cross infections in the United States are resistant to penicillin, streptomycin, and the tetracyclines, these antibiotics were employed as overwhelming favorites with all other antibacterials being used infrequently.

The physicians evaluating this series of patients and reviewing the statistics believed that 72 (15%) of the 496 patients receiving antibacterials

prophylactically should not have been given these drugs for this purpose and only two cases should have received these drugs when they were withheld. Another significant fact emphasized by the statistics was that there were three times as many postoperative infections, either local wound or or of other sites, in the group receiving antibacterials as there were in the group not receiving these drugs. The reasons for this are not apparent; perhaps this may have been due to a greater number of poor risk patients in the group receiving prophylactic antibacterials. But, on the other hand, it is possible that those surgeons using prophylactic antibacterials were not as careful of their aseptic surgical techniques and relied too heavily on the antibacterials.

From the field of fact to the realm of fancy is but a short step and, in this particular study, speculation based on facts provides some interesting estimates of economic waste due to the unnecessary administration of antibacterials. From the statistical study it was found that 421 (74%) of patients received antibacterials needlessly, with the average duration of 5.1 days. If these patients received a minimum of one dose per day they received a total of 2,147 unnecessary doses during hospitalization. If the average cost of each dose to the patient is set at the low figure of 50 cents, the average unnecessary cost for antibacterials projected into the 5,546 general hospitals in the United States could amount to about $247,000 annually. In a comparative manner, considering the waste of nurses' time in giving these unnecessary medications, with a very modest estimate of 3 minutes per dose, then the loss of time projected into these general hospitals could mean a loss of approximately 25,000 nurse hours spent in administering needless antibacterials.

In fact, the author considered these estimates to be conservative, with personal observation from numerous audits in hospitals in all sections of the country, that the prophylactic use of antibacterials in surgery has become almost a routine procedure. (Myers, R.S., The Misuse of Antibacterials in Inguinal Herniorrhaphy: Surg. Gynec. & Obst., 108: 721-725, June 1959)

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Myasthenia Gravis

During recent years there have been significant advances in the understanding of treatment of myasthenia gravis and its underlying pathophysiology. Although not a common disorder, the early recognition and treatment of this disease are of great importance, for incorrect diagnosis or inadequate therapy may unnecessarily force the myasthenic patient to maintain an inadequate physical, social, and psychologic adjustment.

The disorder is characterized by ease of fatigue and weakness of muscles. These include skeletal muscles in specific groups or generalized, or more commonly, extraocular muscles, resulting in the classical initial

complaint of the patient—double vision or drooping eyelids. Involvement of the muscles supplied by the cranial nerves may result in the complaints of difficulty in chewing, talking, swallowing, or breathing. Great variability of muscle weakness and involvement is characteristic, with the patient generally correlating the amount of activity with weakness.

Diagnosis depends on demonstration of the typical ease of fatigue of suspected muscles or groups of muscles on repeated testing. However, if the diagnosis is suspected and not clearly demonstrated, a trial injection of neostigmine or Tensilon is always indicated. The neurological examination will usually be normal in other respects. A more than chance association of some thyroid dysfunction requires thorough evaluation of that gland, although treatment of any disfunction may not materially influence the course of myasthenia gravis. The relationship of the thymus is discussed later.

The diagnostic studies of particular significance include electromyography, chest roentgenogram for possible thymic enlargement or tumor, barium swallow before and after injection of neostigmine or Tensilon, and studies of thyroid function.

The cause of myasthenia gravis remains obscure, although there is virtually no dispute that a defect exists in transmission of the nerve impulse to the muscle at the so-called neuromuscular junction. The major theories include:

1. Deficient synthesis or liberation of acetylcholine
2. Abnormally high concentrations of acetylcholinesterase resulting in increased breakdown of acetylcholine
3. Diminished sensitivity of the muscle to acetylcholine
4. Presence of some barrier at the myoneural junction

The time-honored test employing neostigmine, an anticholinesterase agent, is of great diagnostic importance. If equivocal, it is best to consider the results of the test to be diagnostic and a trial of medication begun, for less harm will result from allowing the nonmyasthenic to have a trial on anticholinesterase drugs than to let a patient with myasthenia gravis go without treatment. Within a short time the accuracy of the diagnosis will become apparent.

The Tensilon (edrophonium chloride) test is thought by some neurologists to be an improvement over the neostigmine test. This chemical possesses some anticholinesterase activity, but also seems to have a direct stimulatory effect on the myoneural junction.

There are advantages and disadvantages of each of the tests, and combinations of both tests are frequently employed to aid in more definitive diagnosis.

Before instituting therapy in myasthenia gravis, it is of the utmost importance that the patient have a thorough understanding of the nature of his disease, the therapeutic agents, and goals of treatment. Neostigmine was the drug of choice for many years with the recent introduction of Mestinon (pyridostigmine) tending to supplant it.

Following a thorough muscle strength evaluation, the patient begins therapy carefully analyzing and noting the timing of the therapeutic results of individual doses of the drug employed. This procedure is followed day by day during a period of one or two weeks enabling the physician and the patient to determine the individual requirement. It may be found that increased or varying dosages may be required at certain times of the day, or preceding certain activities such as eating. The mild myasthenic may require only 2 to 4 Mestinon tablets each day while other patients may require 5 to 15, and the severe myasthenic may require over 20 tablets a day.

With anticholinesterase treatment, some patients experience uncomfortable side reactions of parasympathetic overactivity—most commonly nausea, abdominal cramps, diarrhea, and urinary frequency or urgency. These reactions may be ameliorated by taking the medication with milk or food; or, in more pronounced reactions, by belladonna or atropine sulfate. In the initial phase of therapy, until accurate evaluation of the effectiveness of the medication is determined, neither atropine nor belladonna should be employed unless the reactions are severe.

Neostigmine bromide may act more promptly than Mestinon but have a shorter duration of action and produce more side reactions. A "let-down" feeling is often experienced—the effect of the drug seeming to wane suddenly. Individual variability of response will determine which of the two is to be preferred. A combination has been found to be effective with neostigmine being resorted to when quick increase in strength is to be desired, and Mestinon when a more prolonged and smooth effect is advantageous. The combination of drugs is not to be recommended until the patient becomes experienced in his reactions to each of the drugs individually.

In recent months Mestinon Timespan tablets have become available. Evaluation and trial of this dosage form may prove desirable since the duration of action is considerably lengthened. Another new drug, Mytelase (ambemonium chloride), presents action somewhat longer than neostigmine or Mestinon, with considerable variability in the optimum dose. Headache may be a more prominent side effect, but muscarinic reactions are often less frequent and may be of some concern as cholinergic crisis may develop without significant premonitory signs. Other forms of therapy such as ephedrine, potassium, guanidine, glutamic acid, and others are either unsatisfactory or of doubtful effect.

The moderate or severe myasthenic patient may fail to show an adequate response to his medication and rapidly worsen. The management of this condition, commonly called myasthenic crisis, becomes a medical emergency particularly when the bulbar muscles are involved. The problem is complicated, for over-dosage of anticholinesterase agents may produce profound weakness closely simulating a myasthenic crisis, called cholinergic crisis. In one condition, more anticholinesterase agents are indicated, while in the other, they might prove fatal by severely increasing the weakness. There are

several clinical criteria by which the two disorders can be distinguished, although the differentiation cannot be made with assurance in all cases.

Despite the criteria, the differentiation between cholinergic and myasthenic crises may prove difficult even for experienced neurologists. Therefore, it must be emphasized that the general practitioner must not delay treatment too long. If the history and findings are not sufficient to make a differentiation, it must be remembered that a fatal outcome usually will be due to respiratory obstruction and failure, and to prevent death, the patient's airway must be clear and respirations must be maintained. It is far preferable to prepare for and to treat respiratory embarrassment too soon rather than too late. In the event a mechanical respirator is necessary the physician no longer must worry about an immediate differentiation of conditions. Cholinergic crisis will subside as excess medication is metabolized; or the patient will remain in myasthenic crisis and the situation will become evident.

If the diagnosis of myasthenic crisis can be confirmed on first examination, parenteral injection of neostigmine may be repeated as often as necessary, exercising care to prevent myasthenic crisis from becoming cholinergic crisis. If cholinergic crisis is diagnosed, large doses of atropine may be given every one or two hours until signs of atropinization occur.

The presence of neoplasms of the thymus in a significant number of patients with myasthenia gravis has resulted in attempts to alleviate myasthenic weakness by surgical removal of this gland even when no tumor is discovered. The value of this form of treatment has been subject to dispute, with experienced neurologists not being in agreement. (Magee, K. R., The Treatment of Myasthenia Gravis: GP, XIX: 117-126, June 1959)

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Liver Function Tests in Surgical Conditions

There is disagreement as to the diagnostic value of liver function tests, particularly in surgical patients. However, they can be of great value provided proper interpretation is placed on their results. Very important is the fact that the liver performs a multitude of functions, and no one test will yield data on all of them.

Before proper interpretation can be placed on the results of these laboratory aids, the significance of the respective tests must be kept in mind. In general, the purpose of the thymol turbidity and cephalin flocculation tests is to detect quantitative and possible qualitative changes in the serum albumin and globulin (primarily gamma fraction). These protein alterations result from hepatocellular inflammation or breakdown. The enzyme alkaline phosphatase is excreted in the bile and likely is in part produced by the liver. Hyperbilirubinemia results either from inability of the hepatic cell to pass enough of the bile pigment into the biliary radicles or from obstruction of the

biliary outflow. Abnormal albumin/globulin ratios, as they apply to liver disease, are generally the result of long-standing hepatic dysfunction. The failing ability of the liver to produce albumin plus the appearance of increased amounts of serum globulin account for this finding. An increased prothrombin time may be due to one of two causes, the inability of the liver to synthesize prothrombin because of cellular abnormality, or diminished vitamin K absorption secondary to lack of bile in the intestine. Because hepatic parenchymal or obstructive disease commonly causes the prothrombin time to be abnormal, this test is of relatively little diagnostic value, but remains an important laboratory procedure in the management of patients with hepatobiliary disease.

The bromsulphalein test deserves special mention. This test is one of the simplest, most sensitive, and reliable tests of hepatic function in the patient without jaundice, measuring both the blood flow through the liver and the excretory capacity of the liver cell. Unfortunately, the bromsulphalein test is of little diagnostic value in the presence of jaundice, and attempts to correct the result, taking into consideration the presence of icterus, have not proved of value.

Care must be taken in the interpretation of the results of liver function tests to exclude causes other than hepatobiliary disease for abnormal values. For example, an elevation of the alkaline phosphatase may result from osseous disease and hyperbilirubinemia may be secondary to hemolytic states, both of these being independent of liver function.

The purpose of the report was to evaluate experience with liver function tests in 224 patients with established hepatobiliary disease. Most of the diseases studied were surgical, but some important non-surgical diseases such as viral hepatitis and cirrhosis were included. It became evident that the results of tests performed soon after admission were usually more important than those performed later. However, the value of serial determinations was unequivocal

In patients with cirrhosis the three important features were: (1) bromsulphalein retention in 95%, with the majority being marked; (2) a reversed albumin/globulin ratio in 53%, and (3) an elevated thymol turbidity in 81%. Cirrhotic patients with varices were found to have a higher incidence of hyperglobulinemia than those in the cirrhotic group as a whole.

Patients with portal vein thrombosis were included because they often present indirectly with bleeding esophageal varices, and the differential diagnosis arises with the more common etiologic factor, cirrhosis. The liver function tests in this study clearly separated these patients from those with cirrhosis, since test results were normal with the exception that two-thirds of the patients with venous thromboses had an abnormal prothrombin time.

Like the other major category of hepatic parenchymal disease (cirrhosis) all patients with viral hepatitis had abnormal tests. The most significant feature was the fact that the thymol test was elevated in 98% of the patients and

markedly so in two-thirds; in 88% of the patients in this group the cephalin flocculation test was positive. Only 7% had an abnormal albumin/globulin ratio. Minimal elevations of the alkaline phosphatase were common.

The primary neoplasms of the liver, most of which were carcinomas, were associated in four instances with coexisting cirrhosis. The only constant observation was that all patients tested had significant bromsulphalein retention, most to a marked degree. Hypoalbuminemia was common. In about one-half, the prothrombin test and either the thymol or cephalin tests were positive.

In metastatic hepatic neoplastic disease the most prominent finding was bromsulphalein retention in seven of ten patients tested. In five of nine patients the alkaline phosphatase test was abnormal, but usually to a minimal degree.

The eighty-four patients with extrahepatic obstruction of the biliary tract from all causes were considered together because they had similar test results, the type of obstruction causing variation only in degree. The single most noteworthy finding was an 89% incidence of alkaline phosphatase elevation, associated with only a 5% occurrence of cephalin flocculation abnormality.

Several additional facts were apparent from this study: (1) In no group of patients was the cephalin flocculation abnormal as often as the thymol turbidity. This fact is indicative of the comparatively greater sensitivity of the latter over the former. In the patients with primary parenchymal disease both these tests were positive in a high incidence, but in patients with obstructive disease the cephalin flocculation was uncommonly positive and the thymol turbidity only occasionally so. (2) The bromsulphalein test was noted to be of little diagnostic value in the presence of jaundice. (3) A significant incidence of prothrombin time abnormality was noted in every type of disease process considered.

From these observations it was concluded that liver function tests were of definite diagnostic value particularly in differentiating intrahepatic disease from extrahepatic obstruction. The thymol was a reliable test of hepatic parenchymal disease in patients with obstruction of the extrahepatic biliary system. Serum alkaline phosphatase values were elevated in at least three-quarters of patients with extrahepatic obstruction. The bromsulphalein test was the most frequently positive test in cirrhosis and was commonly so in hepatic neoplastic disease. (Hunter, J.A., The Value of Liver Function Tests: Am. J. Surg., 97: 702-708, June 1959

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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, 19 June 1958.

Trigger Mechanisms in Asthma

The ingenuity of the chest specialist may be taxed to the limit in the management of intractable asthma. Underlying factors influencing the intense and generalized bronchospasm are complex. They include: allergy, emotional disturbances, disharmony of sympathetic and parasympathetic nerve control, infection, mucosal thickening, and problems of secretion elimination. Although asthma is considered to be a medical disease, irreversible structural changes in the bronchial system may exist. The presence of such mechanical problems—"trigger mechanism"—should be determined and consideration given to their correction.

The interest of thoracic surgeons in the serious plight of the asthmatic was first kindled by the physiologic work on the nerve control of the lung. More than 100 years ago, Williams investigated the influence of the vagus nerve on bronchial caliber. Later work established the facts that: (1) the preponderance of constrictor fibers are found in the vagus; (2) the preponderance of dilator fibers are in the sympathetic (T1-T2-T3); (3) both systems carry both types of fibers; and (4) fibers cross from right to left and vice versa. Kummel, in 1923, was the first to treat asthma by the removal of the stellate ganglia. Since then, there have been many attempts to relieve bronchospasm by interrupting the nerve supply to the lung.

In the past, the attention of most surgeons centered on interventions which interrupted the efferent or afferent nerve pathways to the lung. Usually, search was not made for structural abnormalities. Overlooked "triggers" quite possibly contributed to disappointing lasting results of denervation alone. However, it has been recognized that disturbances in one area of the bronchial system may act as a "trigger" to set off general bronchospasm.

Intractable cases of asthma should have the benefit of a thorough investigation, particularly those whose history is characterized by: (1) initiation by an attack of pneumonia; (2) frequent colds with lower respiratory tract involvement; (3) productive cough; (4) unilateral wheeze; (5) chest discomfort or pain; and (6) systemic evidence of focal infection, such as arthritis. The decision as to surgical exploration in the presence of no demonstrable structural abnormality depends on the degree of disability and the burden of the medical regimen. Without bronchographic indication of abnormality, there may be strong presumptive evidence of mechanical difficulty which may profit from exploration and correction.

Asthma is no contraindication to bronchoscopy, in the author's opinion, and much may be learned from careful technique and repeat examination if indicated.

The study of the integrity and behavior of all segments of the pulmonary tree is the first accomplishment of surgical exploration. Proper examination requires an adequate exposure of a completely mobilized lung.

It should be carefully inspected and palpated and its response to alterations in intrabronchial pressure tested. Variations in pigmentation are noted. In adults, the lymphatics will be laden with carbon particles in the segments which have been capable of ventilation. Nonfunctioning segments are usually devoid of pigment. The majority of the unpigmented areas trap air and remain inflated during the period of manipulation. Occasionally, an indurated, contracted, atelectatic segment will be found which is free of pigment. Such a segment probably has been defunctionalized since childhood.

Variations in segmental density can be determined quite accurately by palpation. Bronchiectatic segments in which there has been chronic infection may show areas of contraction, thickening, or nodulation. Enlarged lymph nodes and calcific deposits can be removed. The mediastinal pleura should be opened to facilitate inspection and palpation of that area. The esophagus is inspected and palpated under the azygos vein on the right or under the aorta on the left. Fibrotic, calcific, or enlarged lymph nodes wedged between the esophagus and major bronchi are removed.

The compliance of the lung to pressure changes in the closed anesthetic system is the most important of all observations. When the bronchi are in spasm, the lung builds up a volume greater than that of the hemithorax. This situation provides an opportunity to test the effect of denervation. All branches of the vagus nerve can be readily divided. In some cases, the healthy segments of the lung will immediately and uniformly deflate. In most, there will still be evidence of delayed or incomplete deflation and greater than normal pressure will be required to effect reinflation. Diseased and functionless segments are not influenced by the denervation. Next, the parasympathetic pathways are interrupted, usually resulting in a dramatic change in the behavior of the lung. Healthy segments then readily comply to pressure variations as found in nonasthmatic individuals.

The final accomplishment of the exploration is concerned with the necessity for, and extent of, tissue excision. The surgeon liberates abnormally anchored segments, divides adhesions or bands, decorticates constricted segments, removes enlarged nodes or destroyed segments, denervates a spastic lung and works with it until all healthy segments are functioning properly.

In evaluation of the results of this therapeutic approach, review was made of 43 patients treated surgically between the years 1945 and 1956. Twelve patients were treated by denervation alone with 10 of the group showing some degree of improvement. Results were better in those in whom functionless segments were found and removed. There were 31 patients followed for periods of 18 months to 12 years. All were improved to some degree, 75% significantly, requiring no or only occasional medication, and 50% were considered to be well and completely free of asthma. (Overholt, R. H., Trigger Mechanisms in Asthma: Dis. Chest, XXXV: 587-593, June 1959)

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Sixty-First Anniversary of the Founding of the Hospital Corps

An open letter from Rear Admiral Bartholomew W. Hogan, Surgeon General of the Navy, to all Hospital Corpsmen upon the occasion of the Sixty-First Anniversary of the founding of the Hospital Corps is quoted:

"As Surgeon General of the United States Navy, I extend my hearty congratulations and best wishes to every Hospital Corpsman upon this anniversary of the founding of the Hospital Corps!

The Hospital Corps was created by an Act of Congress on June 17, 1898 for the purpose of assisting the Medical Corps in the care of the sick and injured. This infant Corps created 61 years ago has now grown to full maturity. It assumes a full share of communal responsibility in the Medico-Military family consisting of five Corps and known collectively as the Medical Department of the Navy.

The Medical Department is justly proud of its record of accomplishments, among the many being a remarkably low mortality rate for our wounded in two world wars and the Korean Conflict. A full share of credit for these accomplishments is due the Hospital Corps. Without the bravery and devotion to duty of the Hospital Corpsmen this record could not have been achieved.

The Hospital Corps is often referred to as the most decorated Corps in the Navy. In time of war the bravery of Hospital Corpsmen is legendary. In time of peace their long hours devoted to care of the sick and injured in hospitals and on board ships is equally meritorious, though less spectacular.

On this anniversary of the Hospital Corps, I wish to call attention to this less glamorous phase of the duties performed by Hospital Corpsmen and to commend them for their continuing devotion to duty during a period when reward through advancement in rating was very limited. I am very happy to report that in the immediate future opportunity for advancement in rating will be markedly improved. On behalf of the Medical Department of the Navy, I say to each Hospital Corpsman 'Well done. Well done, indeed.'"

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Congratulatory Letters

"My dear Admiral Hogan:

On behalf of the United States Marine Corps, I take great pleasure in extending heartiest congratulations and best wishes on the sixty-first anniversary of the establishment of the Navy Hospital Corps.

In time of war and in time of peace, Navy Hospital Corpsmen have accompanied Marines in all parts of the world. We Marines have a deep sense of appreciation and gratitude for the faithful, competent, and often courageous care given by Navy Hospital Corpsmen to our sick and wounded. We are proud to have such loyal comrades.

With warmest personal regards and every good wish for the continued success of the Navy Hospital Corps, I remain

Sincerely yours,

/s/

R. McC. PATE
General, U. S. Marine Corps
Commandant of the Marine Corps"

Rear Admiral Bartholomew W. Hogan, MC, USN
Chief, Bureau of Medicine and Surgery
Department of the Navy
Washington 25, D. C.

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The Chief of the Bureau of Medicine and Surgery recently received a letter from the Chief of the United States Navy Mission to Haiti. The following paragraph is quoted:

"The reputation of Naval medicine is one of the most enduring remembrances of the United States protectorate over Haiti. People here still look back on the outstanding, devoted, and capable medical services performed by the Navy in the past. It is historically part of the prestige of the United States in Haiti. We have much to live up to."

Medical Aspects of Modern Warfare

The following classes in Medical Aspects of Modern Warfare will be conducted at the Air University, Maxwell Air Force Base, Ala., during Fiscal Year 1960:

Class No.	Class Dates	Reporting Date
59-B	19 - 30 Oct 1959	0730, 19 Oct 1959
60-A	25 Jan - 5 Feb 1960	0730, 25 Jan 1960
60-B	28 Mar - 8 Apr 1960	0730, 28 Mar 1960

The Navy has been allotted a quota of 5 spaces for each course. Applications are encouraged from interested officers in the ranks of Captain or Commander to attend the above course. TOP SECRET security clearance is required on all candidates approved for attendance.

Officers desiring to attend this course should submit a written request to the Bureau of Medicine and Surgery via their Commanding Officer. All requests must be received in this Bureau by the following dates:

Class No.	Deadline for request to reach BuMed
59-B	7 September 1959
60-A	14 December 1959
60-B	15 February 1960

All requests must indicate that a Security clearance of TOP SECRET or interim TOP SECRET has been granted to the officer requesting attendance.

Successful candidates will be issued Temporary Additional Duty travel and per diem orders from this Bureau's training funds. (ProfDiv, BuMed)

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Obstetrics and Gynecology Seminar

The Surgeon General has approved the holding of the Fifth Armed Forces Obstetrics and Gynecology Seminar at the U. S. Naval Hospital, Portsmouth, Va., during 25 - 28 October 1959.

Interested officers of all Services are invited to submit original papers for inclusion in the program. It is hoped this year to have serivce personnel present as many of the papers as possible, utilizing civilian and military consultants on panel discussions and as discussants of papers.

Those Medical officers with papers to offer or suggestions for the program, as well as those who would like their names to be on the mailing

list, are urged to write to CAPT D. A. Callagan MC USN, Chief, Dependents' Service, U. S. Naval Hospital, Portsmouth, Va.

Naval Medical officers who desire to attend the Seminar should submit a written request via their Commanding Officer to arrive in the Bureau of Medicine and Surgery by 18 September 1959. Requests should be submitted in compliance with BuMed Instruction 1520. 8 and guidelines for selecting officers to attend will be as outlined in paragraph 5 of this Instruction. Officers selected by the Bureau's Advisory Board will be approved for Temporary Additional Duty travel and per diem orders. (ProfDiv, BuMed)

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From the Note Book

1. On 19 June 1959, Rear Admiral B. E. Bradley MC USN was detached as Deputy Chief of the Bureau of Medicine and Surgery. Admiral Bradley assumed command of the National Naval Medical Center as the relief of Rear Admiral T. F. Cooper MC USN who was placed on the Retired List 30 June 1959.

2. Rear Admiral E. C. Kenney MC USN relieved Rear Admiral B. E. Bradley MC USN as Deputy Chief of the Bureau of Medicine and Surgery on 19 June 1959.

3. A Television Workshop Seminar was held 15-16 June 1959 at the National Naval Medical Center, Bethesda, Md., for representatives of medical and dental schools throughout the United States. The seminar developed as the result of inquiries from various schools concerning the operation of the Television Projects Department of the Center. A primary goal of the seminar was the exchange of ideas and experiences by those utilizing television for medical and dental instruction with the demonstration and discussion of the varied types of television systems presently available. A unique feature was a presentation on color microscopy in which the sequential television camera and Eidophor projector were used to examine slides on a television screen. This was the first such meeting and it is hoped that the result will provide guide lines for subsequent seminars. (NNMC)

4. At the U. S. Naval Hospital, San Diego, Calif., 102 asymptomatic patients with abnormal chest x-ray findings were subjected to diagnostic thoracotomy during a two-year period. In 89, a granuloma was found and excised, the etiology of which in 48 was nonspecific; in 23, tuberculosis; in 15, coccidioidomycosis; in 2, histoplasmosis; and other single miscellaneous lesions. Only two cases of carcinoma were encountered, the presumption being that the lower average age of 32 years accounted for the disparity between the authors' experience and the reported experience of others. Other studies have stressed

the importance of silent pulmonary nodules for the purpose of obtaining early diagnosis and significantly higher cure rates for carcinoma of the lung. In the younger segment, the potentially dangerous nature of the granuloma is in relation to the predicted 25% reactivation of a tuberculous lesion and resultant loss from active service by retirement or prolonged hospitalization. Minimal morbidity and mortality were associated with the procedure of the authors. (Dis. Chest, May 1959; CAPT N. V. Cooley MC USN et al.)

5. This study of 214 young adults crippled by poliomyelitis or cerebral palsy was undertaken to determine the present activity of these individuals and to make a rough evaluation of their needs for vocational training and placement. (J. Pub. Health, May 1959; W. E. Mosher, M. D.)

6. An analysis of 75 patients with primary lymphosarcoma of the stomach is presented. Follow-up periods ranged from one month to 20 years. Sixty-four had histologically verified small round cell lymphosarcoma and 11 had reticulum cell lymphosarcoma. (Am. J. Med., May 1959; A. I. Friedman, M. D.)

7. The x-ray appearance of staphylococcal pneumonia, on review of 76 cases at the Los Angeles County Hospital since 1950, impressed H. I. Meyers and George Jacobson with certain diagnostic features, particularly in the young child, and contributed to early diagnosis and effective therapy. These features included: rapid change in roentgen findings, early appearance of pleural effusion and empyema with abrupt variation in extent, pneumatocele formation, and pneumothorax. The picture in adults was by no means so clear-cut, with infiltration being a more prominent feature, although, with the exception of pneumothorax, the features listed were found in the occasional case. (Radiology, May 1959)

8. Phenothiazine compounds are used extensively in clinical medicine, and are of particular concern to the anesthesiologist because of undesirable effects which at times outweigh desirable effects. Their value is determined by the ratio of desirable to undesirable properties of the individual agents. The desirable features include sedative and tranquilizing actions, decrease of secretory activity, potent antiemetic effect, and reduction of myocardial irritability. However, the more important physiological properties may include prolongation of postoperative awakening time, sympatholytic and adrenolytic effects, and resistance of hypotension in varying degrees to standard vasopressors. The variability of the effects of the various phenothiazine derivatives was studies by Eggers, et al. employing dogs as subjects. (Anesthesiology, May-June 1959; G. W. N. Eggers Jr., M. D., et al.)

9. The rationale of Vasopressor Treatment of Cerebrovascular Insufficiency and Coronary Insufficiency—a review of current therapy by J. H. Williams

and E. Corday points out the physiological effect of these drugs in reducing the irreversible changes of the brain or heart incident to prolonged hypotension. The body economy provides for increased circulation to the brain, heart, and liver in stages of shock since these organs are least able to withstand prolonged periods of ischemia, with compensatory reduced flow to the renal and mesenteric circulations. The use of vasopressor drugs enforces this natural effect during periods of urgency. (Dis. Chest, May 1959)

10. Noting the increasing interest in the occurrence of oral melanosis with intestinal polyposis also known as Peutz-Jeghers syndrome, Zegarelli, et al have combined in this article an excellent atlas of photographs representing 20 patients and 14 authors depicting the oral lesions observed in this condition. (Am. J. Digest. Dis., June 1959; E. V. Zegarelli, D. D. S.)

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BUMED INSTRUCTION 6320.4F 9 June 1959

From: Chief, Bureau of Medicine and Surgery
To: Naval Hospitals, Medical Centers, Activities Having Station Hospitals or Dispensaries with Authorized Beds, and USS HAVEN

Subj: Hospitalization and subsistence rates; and hospitalization costs, elements of

Ref: (a) Art. 21-3, ManMed

This instruction promulgates information concerning hospitalization and subsistence rates pertaining to per diem rates to be collected locally for inpatient medical care and subsistence furnished certain supernumerary patients at naval medical treatment facilities; and meal rates to be collected locally for rations sold authorized personnel from naval hospital messes. It provides a basis for tabulating cost elements on hospitalization bills submitted to certain supernumerary patients and establishes uniformity in cost estimates of services furnished. This instruction supersedes BuMed Instructions 6320.4E and 7310.1A.

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Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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DENTAL SECTION

Change of Personnel Assignments in Dental Division

Captain A. R. Frechette DC USN relieved Captain B. H. Faubion DC USN as Deputy Chief of the Dental Division, Bureau of Medicine and Surgery on 15 June 1959. Captain Faubion will assume the duties of Fleet and Force Dental Officer, CincPacFlt and ComServPac in July. Captain Frechette has been the Head of the Professional Branch, Dental Division, since September 1956, and has been relieved by Captain W. R. Stanmeyer DC USN.

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New Extension Course in Endodontics

A new extension course in endodontics (NavPers 10407) is now available to Dental Corps officers of the U. S. Navy and the Naval Reserve. The course was prepared by the U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md., and represents a new concept in teaching by correspondence. The course material was written especially for Dental officers; therefore, it is intended to serve as a short postgraduate level review of the subject rather than as a comprehensive introduction to endodontology.

The course materials include three sets of 2 by 2-inch transparencies which serve to illustrate the textual material. These slides offer a training aid that could not be equaled by printed matter. They may be projected on a screen for detailed study, a pocket viewer may be used, or they may be studied by simply holding them up to the light.

The course is divided into three assignments, each of which is concluded with a group of objective type questions. The first assignment covers the rationale, the diagnosis, and the selection of cases for endodontic therapy. The second assignment deals with instrument sterilization and the biomechanical preparation and medication of root canals. The third assignment includes the filling of root canals, apical surgery, and the bleaching of pulpless teeth.

Endodontics is the second professional extension course developed by the U. S. Naval Dental School. The first course, Prosthodontics, Part II, is based on the textbook, Partial Dentures, by Swenson and Terkla. This

course which first became available in November 1958 has been completed by thirty-four Dental officers. Other professional courses are nearing completion and will be available in the future.

Requests for enrollment should be addressed to the Commanding Officer, U. S. Naval Dental School (Code 5), National Naval Medical Center, Bethesda 14, Md. Use NavPers Form 992, changing the "To" line appropriately.

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Pulmonary Infarction After Dental Extraction

Two case histories reported by Crawford W. Adams, M. D., and James M. Hudgins, M. D., in the May 23, 1959 issue of The Journal of the American Medical Association, illustrate the occurrence of pulmonary disease after extraction of teeth. In the first case which involved a 40-year old man, the pulmonary symptoms commenced 7 days after the extraction with a sudden rise of temperature to 40° C. on the tenth day marking the development of a pulmonary infarct. In the second case, involving a 28-year old man, the pulmonary symptoms commenced 5 days after the extraction and the subsequent course was marked by two episodes of severe chest pain indicating the development of pulmonary infarcts. Although the connection of the pulmonary symptoms with the dental procedures was not at first obvious, it became clear later that both patients had cervical phlebothrombosis which led to the pulmonary complications. It is concluded that in all cases of unexplained pulmonary infarction the patient's dental history should be considered.

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Stag Reception for Regular and Reserve Dental Officers

In conjunction with the Centennial Session of the American Dental Association, a stag reception for U. S. Navy Regular and Reserve Dental officers will be held from 5 to 7 p. m. on September 14, 1959, at the Barbizon-Plaza Hotel, 106 Central Park South, New York City. Tickets at $7.00 each may be obtained from:

Captain Clay A. Boland DC USNR
Headquarters, Third Naval District
90 Church Street
New York, N. Y.

Reservations should be made early due to the limited capacity of the reception room.

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RESERVE SECTION

Active Duty for Training - Fiscal Year 1960

Following are the active duty for training courses available to Medical Department Naval Reservists in both pay and non-pay programs. As the assignment to active duty for training is a matter within the cognizance of the respective naval district commandants, interested Naval Reservists should communicate with their commandants concerning the below listed courses:

DIVING MEDICINE

Place: U.S. Naval School Deep-Sea Divers, U.S. Naval Gun Factory, Washington, D. C.

Date: 13 July 1959

This two-week course offers didactic training in underwater physiology and in the recognition and treatment of casualties associated with any kind of diving. Instructions include lectures and demonstrations of the equipment of the Deep Sea Divers' School and Experimental Diving Unit. This course is given for active duty personnel enroute to stations where there is some diving activity; however, vacancies in the course may be filled by Reservists on active duty for training.

Eligibility Requirements: Naval Reserve Medical and Medical Service Corps, male officer personnel only. Quotas have been authorized for the 1st, 3rd, 4th, 5th, 6th, 8th, and 9th Naval Districts.

SEMINARS FOR COMMANDING OFFICERS OR THEIR REPRESENTATIVES, NAVAL RESERVE SPECIALIST UNITS (MEDICAL)

Place: Headquarters, each continental naval district except the 11th and 13th. The seminar for the West Coast will be held by the 12th District.

Date: 2 - 6 November 1959

This course provides indoctrination and orientation in the organization, administration, and operation of the Naval Reserve Program from the naval district level with particular emphasis on the medical components. Field trips to a naval hospital and other facilities in the district area will be conducted. A series of meetings will be held between the trainees and officers of the district staff with a view towards an improved Medical Reserve Program through the exchange of ideas and recommendations.

Eligibility Requirements: Members of Naval Reserve Specialist Units (Medical), with priority being given to commanding officers, executive

officers and training officers in that order. Quotas have been authorized for all continental naval districts.

MEDICAL MILITARY TRAINING

Place: U.S. Naval Medical School, National Naval Medical Center, Bethesda, Md.

Date: 7 March 1960

The first week is devoted to Medical Aspects of Special Weapons and Radioactive Isotopes with particular reference to personnel casualties from atomic explosions. The second week is devoted to professional topics of concern to military medicine, including discussions on Reserve Medical Programs of the Armed Forces.

Eligibility Requirements: Naval Reserve Medical Department officer personnel. Quotas have been authorized for the 1st, 3rd, 4th, 5th, 6th, 8th, and 9th Naval Districts.

AFLOAT ON MSTS SHIPS

COMSTSLANTAREA

Place: 58th Street and First Avenue, Brooklyn, N. Y.

Date: Sailing dates published in MSTS PA Schedule available to all naval districts and NRMSTS Units.

COMSTSPACAREA

Place: Fort Mason, San Francisco, Calif.

Date: Sailing dates published in MSTS PP Schedule available to all naval districts and NRMSTS Units.

On-the-job training to provide experience aboard ships.

Eligibility Requirements. Any inactive Reserve Medical Corps and Nurse Corps officers. Quotas. Reservists in the 1st, 3rd, 4th, 5th, 6th, 8th, and 9th Naval Districts are eligible for COMSTSLANTAREA; those in the 8th, 9th, 11th, 12th, and 13th Naval Districts are eligible for COMSTSPACAREA.

DISEASE VECTOR AND ECONOMIC PEST PREVENTION AND CONTROL

Place: U.S. Navy Disease Vector Control Center, U.S. Naval Air Station, Jacksonville, Fla.

Dates: 3 - 15 August 1959 5 - 17 October 1959
17 - 29 August 1959 7 - 19 December 1959

DISEASE VECTOR CONTROL

Place: U.S. Navy Disease Vector Control Center, U.S. Naval Air Station, Alameda, Calif.

Dates: 1st Monday of February, April, June, August, October, December, and the 3rd Monday of June and August

Series of lectures, demonstrations, and field experience relating to vector and pest prevention and control procedures with special reference to naval preventive medical aspects. The role of insects, other arthropods and rodents in the disease-vector-reservoir-host relationship is given careful consideration. Recognition, identification, biology, and habits of the vectors in relation to prevention and control are stressed. The types, procurement, toxicity, safe use, and proper choice and application of pesticides are discussed, including recent advances and developments. Trainees are required to complete an individual project on some phase of insect and rodent control as assigned.

Eligibility Requirements: Naval Reserve Medical Department personnel (including enlisted hospital corpsmen and CEC officers). Quotas: Reservists in the 1st, 3rd, 4th, 5th, 6th, 8th, and 9th Naval Districts are eligible for training in Jacksonville, Fla; those in the 11th, 12th, and 13th Naval Districts are eligible for training in Alameda, Calif.

NOTE: Other types of active duty for training available during fiscal year 1960 will be published in succeeding issues of the Medical News Letter.

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PREVENTIVE MEDICINE SECTION

Plastic Bags - A Hazard to Children

Plastic bags have come into widespread use by laundries and dry cleaning establishments as a protective covering for finished garments. Many household uses have been discovered for these free plastic covers, such as covers and containers for diapers, rags, toys, and crib mattresses as well as many other uses around the home because they are pliable, elastic, water proof, transparent, tear resistant, handy, and easy to clean.

Small children have found that these bags have many attractive play uses. When placed over the head as a transparent mask, an electrostatic charge develops on the material through friction which causes the bag to adhere to the face in such a manner as to act as a seal for the child's head. Efforts of the child to free itself cause the bag to adhere even more closely and will rapidly use up the entrapped air. A number of deaths have been reported by civilian physicians as being attributed to this cause.

A warning against plastic bags as dangerous to small children has been issued by the American Medical Association and the Public Health Service. Parents should destroy plastic bags or keep them out of the child's reach.

(Safety, Health Practices Branch)

Typhoid Carrier Located by Sewage Sampling

A study was made of the feasibility of searching for typhoid carriers by culturing samples of sewage taken at different points within a city. In this instance, it was possible to localize the residence of a carrier to a single block. Further localization was rendered unnecessary when positive specimens were found in the sewage outflow from the community hospital and the name of a resident of the suspected block was found in the hospital rosters.

Direct stool cultures from this man showed him to be a typhoid carrier and phage typing of the organisms indicated that he probably had acquired his infection many years previously in Europe. Localization was also accomplished by household toilet swabs. The method has proved feasible as a practical field study technique. (Shearer, L.A., et al., Discovery of Typhoid Carrier by Sewage Sampling: J.A.M.A., 169: 1051-1055, March 7, 1959)

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Venomous Fish Stings

Venomous marine fishes are hazards to swimmers and skin divers. The injury is produced by specialized spines containing venom glands. These spines are associated with fins, gillcovers, or tails. The stings of these fishes are usually extremely painful and may be fatal.

Species of venomous fishes include horned sharks (Squalus), stingrays (species of seven families), ratfishes (Chimaeroids), catfishes, weeverfishes (Trachinidae), scorpionfishes (Scorpaenidae), toadfishes (Batrachoididae), surgeonfishes (Acanthuridae), dragonets (Callionymus), rabbitfishes (Siganidae), and star-gazers (Uranoscopidae). Species of these fishes are found in all oceans and seas of the world in tropical and temperate regions.

Stings are usually acquired through careless handling of these fish or, as in the case of stingrays, by stepping upon them. Pain usually develops immediately and increases in severity and may be excruciating. The wound is usually of the puncture type but may be lacerated. Swelling is usual and there may be early ischemia followed by cyanosis. Gangrene can occur. Other symptoms which may occur are cardiac failure, respiratory distress, delirium, convulsions, various nervous disturbances, nausea, vomiting, lymphangiitis and lymphadenopathy, and fever. Death may follow.

Treatment should be directed towards alleviating pain, combating effects of the venom, and preventing secondary infection. Soaking the injured member in as hot water as the person can tolerate for 30 minutes to one hour is usually recommended. This treatment should be instituted as soon as possible. Attempts at removing the venom by sucking or irrigating the wound, incising the wound if necessary, has been recommended. However, fishes do not inject

their venom in the manner that snakes do so that the results from suction may not be too satisfactory. Infiltration of the wound area with 0.5 to 2% procaine has been used successfully in relieving pain. Intramuscular or intravenous demerol may be required. Primary shock generally responds to simple supportive measures. Secondary shock due to action of the venom on the cardiovascular system requires immediate and vigorous therapy. The efficacy and advisability of the use of a tourniquet has been debated. If used, it should be placed at once proximal to the wound and as close to the wound as possible.

Little is known about the nature of the venom of many of these fishes. Recently, an antivenin against the stonefish Synanceja trachynis has been developed for clinical use by the Commonwealth Serum Laboratories, Parkville N. 2, Victoria, Australia. This fish is apparently identical to Synanceja horrida which according to Bruce W. Halstead, M. D., (Dangerous Marine Animals, Cornell Maritime Press, Cambridge, Md., 1959), inhabits the waters of India, the East Indies, China, Philippine Islands, and Australia. Stings from this fish are frequently severe and may be fatal. Complete recovery may require many months. (Health Practices Branch)

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Spiders

All spiders are venomous, although the great majority of species are too small or too mild tempered to harm man. The venom apparatus consists of a pair of hollow fangs and venom glands. In all species except tarantulas points of the fangs come together like ice tongs.

Tarantula. In tarantulas, the fangs move almost parallel to each other. Among a few other details, tarantulas also differ from most spiders by having two pairs of lungs rather than one. These characteristics define a tarantula for the zoologist, but the general public often uses the name to denote any large spider.

No species of tarantula is known to be very dangerous. Venom glands and fang openings are relatively small, and the venom seems to be of low toxicity. Yet the larger tropical species should be treated with caution. The British Museum is said to have a specimen whose abdomen alone is the size of a tangerine.

Black Widow. For a long time, spider poisoning was almost exclusively associated with tarantulas and other large species. As the tarantula story gradually was disproved, a new villain was found in the black widow and her near relatives. The spiders belong to the genus Latrodectus which has a number of species ranging over nearly all the tropical and temperate regions of the world. They are moderate sized, smooth spiders. Most are black or dark brown with red, orange, or yellow markings on the

abdomen and sometimes on the legs. They have relatively large venom glands and fangs and an extremely potent neurotoxic venom. Nearly all species have been known to cause serious poisoning in man.

Some recent work indicates that black widows of the United States, long known as Latrodectus mactans, may be a composite of at least two species, one ranging throughout the country and into Canada and one primarily southern. This may explain why black widow bites from some areas seem more serious than from others. In medical literature, hundreds of case reports of Latrodectus poisoning indicate a fatality rate of 1 to 3%, mostly in young children and the aged. This rate is probably too high, however, because many mild cases are never treated by physicians.

Wolf Spider. The large wolf spiders (Lycosa) often seen running over lawns or occasionally found in houses, especially during the first chilly days of autumn, can nip painfully if molested. A few cases of fairly serious poisoning have been ascribed to them.

Lynx Spider. An unusual spider injury was observed by E. R. Tinkham while serving with the Army in Florida. While repairing a motorcycle, a soldier saw a "green bug" and poked it with a screwdriver. He was struck in the eye from a distance of about 10 inches by a fine spray of liquid "like hot lead." The "bug" was identified as one of the lynx spiders (Peucetia viridens).

Necrosis Spider. Doctors J. A. Atkins, C. W. Wingo, and W. A. Sodeman have recently incriminated Loxoceles reclusus, a small brownish spider often found in houses, as the cause of a type of spider poisoning fairly common in the Midwest and South. Bites of this spider produce a gangrenous area on the skin and sometimes a rash and other evidence of generalized poisoning.

South American Species. The dangerous character of the South American Loxoceles laeta has been known to Latin American physicians for some time. Its bite is occasionally fatal.

At least one other potentially dangerous spider is found in South America, the wandering spider (Phoneutra fera). It is a large, solitary species that constructs no web and apparently has no permanent home. It is said to be aggressive, and several hundred cases of its bite are reported annually in the State of Sao Paulo, Brazil. Some deaths have been reported in children under 6 years old. The bite causes swelling, great pain, and—in severe cases—weakness and irregularity of the heart, difficulty in breathing, and temporary blindness. Several species of wandering spiders belonging to a closely related genus (Ctenus) are found in the southern United States. Therefore, cases of poisoning by these spiders in this country are possible.

Control. Spiders seem to be less susceptible to the chlorinated hydrocarbon insecticides than most other arthropods, but fairly effective control about dwellings has been reported with the use of benzene hexachloride

dieldrin sprays. Webs of black widows are usually located in dark corners and under rubbish. Spiders and their egg sacs may be crushed or burned. Creosote is recommended as a repellent in privies. (Minton, S., Spiders: Pest Control, 4: 30, April 1959)

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Bats - Public Health Importance and Control

Bats—the only mammals with the power of true flight—probably originated in the Old World Tropics. They are now nearly worldwide in distribution, being among the most numerous of land vertebrates. Bats are related to the hedgehog, mole, shrew, and "flying lemur." They range in adult wingspan from 8 to 60 inches ("flying fox" of Java). Their wings consist of the fingers of the hand greatly elongated to support the membranous wing surface. Bats navigate by means of a sonar-like echo location which enables them to avoid objects readily even in total darkness. Flight keeps them from predatory land animals while their nocturnal habits generally keep them from predatory birds. Most bats are insect eaters, but some eat fruit, nectar, pollen, smaller bats, birds, and fish. A few species found in South and Central America drink blood.

Folklore and Historical Aspects. Bats were closely associated with witchcraft in Europe. They were envoys of the devil and vampires (souls of the dead seeking the blood of the living). Mixed into "potions" they cured the sick, imparted alertness, improved nightsight, and sealed curses. Even today, many people throughout the world believe that bats will entangle themselves in the long hair of women. In China they were symbols of rare luck and good times. To many American Indians they were powerful deities. Historically, bats are most known for the part they played in the discovery of Carlsbad Caverns, New Mexico.

Life History. Bats give live-birth to a single young after a gestation period of 2 to 8 months. The baby, about one-third the weight of the mother, is breast fed until able to seek its own food. Most bats have only one young per year (spring or fall), but some species have two or more. Some female bats store the male sperm from fall matings for spring fertilization. Because of their small size and high metabolic rate, bats are very sensitive to cold. Most species hibernate in constant temperature caves or migrate to warm climates in the winter. When bats sleep, even during the summer, their body temperature rises and falls with the temperature of the outside air. Individual bats may live over 20 years.

Beneficial Aspects. Bats eat large numbers of insects and thus keep potential pests in check. Bat guano (manure), an excellent fertilizer, is

mined from bat caves. Emergence of bat swarms from caverns or large buildings is one of the most dramatic sights on earth. Experimental work with bats is yielding important scientific information in such fields as zoogeography, systematic zoology, geriatrics, and gynecology.

Economic Problem. Bats infesting buildings produce offensive odors and distracting noise. Their droppings deface structures and equipment. Some damage fruit and other agricultural products.

Public Health Problem. Blood-drinking bats may bite domestic animals and, rarely, man. Bat ectoparasites (ticks, mites, and fleas) may attack man, particularly when bats are infesting a house. However, the primary public health significance of bats is due to their association with several important communicable diseases.

1. Rabies, a highly fatal virus disease of man and other mammals, is transmitted from animal to animal by infected bites. Rabies is most commonly associated with dogs and other carnivores in human experience, but bats may carry the disease in nature.
2. Derriengue, a modified rabies transmitted by blood-drinking bats, causes great loss of livestock in Trinidad and other areas.
3. Histoplasmosis, a systemic fungus disease of man, may be contracted by inhalation of dusty bat manure containing Histoplasma capsulatum. Bats do not transmit histoplasmosis, but dusty bat manure is a suitable medium for development of airborne spores of the fungus.
4. Chagas' Disease, a protozoal sleeping sickness of man and other mammals caused by Trypanosoma cruzi, is transmitted from infected animals to man by blood-sucking bugs. Bats possibly may be one of the reservoirs of this disease, but are probably of minor importance in this respect.
5. The Relapsing Fevers of man and other animals, caused by spirochetes of the genus Borrelia, are transmitted from man to man by soft ticks. Many vertebrates, including bats, serve as reservoirs of these diseases, but the relationship of bats to the maintenance of the human relapsing fevers remains to be investigated.
6. Japanese "B" Encephalitis, a virus disease of birds and mammals including man, is transmitted from animal to animal by mosquitoes. Bats are indicated as one overwintering mechanism of this disease.
7. Dermatomycoses, fungus infections of the human skin, are usually transmitted by contact from man to man or from domestic animal to man. However, Trichophyton mentagrophytes (causing barber's itch, athlete's foot, ringworm) and Microsporum gypseum (causing ringworm of the scalp, favus) are associated with bat caves, and bats possibly serve as significant reservoirs of these fungi.

Bat Control. Before undertaking bat control, public health personnel should determine what degree of protection is afforded these animals by State and local fish and game laws. In addition, bats form a "nocturnal line of resistance" against insects and reduction of bat populations could result in greatly increased insect-borne disease and agricultural problems.

Personal Protection. Where blood-drinking bats are common, install window and door screens and use mosquito bed nets. Never handle bats, especially if they appear sick. If bitten, report to a physician at once. Personnel engaged in control or research work involving bats should be immunized against rabies.

Bat-Proofing is the most satisfactory method of control in houses. Walls, roofs, and floors should have no openings larger than 3/8 inch diameter. Roosts on the outside of buildings should be eliminated. Completion of proofing should find all of the bats trapped outside. Close all but a few main entrances, wait 4 days to accustom the bats to leaving by these; then at evening after all the bats have swarmed out, close the remaining openings. The structure should be checked for several evenings. If bats are present, the remaining openings must be found and closed. Bat-proofing is best done in early spring and fall. At other times young bats may accumulate on the ground near roosts or be trapped inside to decay and produce odor.

Repellents may be effective in keeping bats out of a building. Paradichlorobenzene and naphthalene (moth flakes), sticky and chemical bird repellents, and rodent repellents are used. Glass fiber insulation blown into spaces occupied by bats will repel them.

Bat Killing, even when safe and legal, gives only temporary relief and is generally unwise. (Scott, H. G., S. A., Scientist Training Branch, Communicable Disease Center, Atlanta, Ga., CDC Training Leaflet, December 1958)

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Some Essentials of Food Establishment Sanitation

(This is the first of a series of articles on "Some Essentials of Food Establishment Sanitation." This article and those to follow will review and discuss certain selected aspects of this important public health problem.)

The food service industry which feeds the American public when it is away from the family dining table is a large complex and important entity in the total economy. The National Restaurant Association issued the following figures to indicate the magnitude of the industry.

Food Service Establishments and Meals Served

Type of Establishment	Percentage of Meals Served
194,123 restaurants, cafeterias, lunch counters, refreshment stands	56.27
26,261 industrial restaurants	4.81
15,100 hotels	7.98
6572 hospitals	4.28
All other types*	26.66

* Includes clubs, taverns and bars, drug stores, department and variety stores, confectioneries, motels and tourist courts, delicatessens, bakery stores, boarding houses, common carriers, educational and religious institutions, and miscellaneous.

While the number of food and drink establishments shown indicates units in the thousands, the number of meals served weekly in the nation's restaurants estimated at 557,690,000 is even more impressive. The gross annual business volume is estimated to be about 17.5 billion dollars—almost 25% of the value of foods consumed in the United States passes through this industry. The restaurant industry ranks first in the number of people it gainfully employs. One out of every six persons working in retail trades is a restaurant employee. There is one restaurant for every 700 people in the United States.

Public Health Importance of the Industry

When the foregoing figures are considered, it is no wonder that public health departments and others devote hours of manpower and a substantial portion of their official health budget to the sanitary supervision of eating and drinking establishments. One does not have to look far to see why this is true. There are at least three good reasons. First, food can transmit infection and disease to the consumer. Improper and careless handling may subject the food to invasion by a variety of microorganisms, thence to the consumer. Second, food may be contaminated with toxic substances, may be adulterated, or may through a large variety of causes become entirely unfit for human consumption. The protection of food purity and wholesomeness, aside from deterioration caused by microorganisms, is also an important factor in terms of consumer protection. The third reason is that phase of food sanitation which is sometimes called esthetic. The physical plant, the surroundings, and the environment where food is prepared and served has an important bearing, both from the viewpoint of food pretection and customer acceptability. People generally are sufficiently discriminating to expect cleanliness in a public food service establishment. While so-called "atmosphere" may not have a close

correlation with public health protection, the customer expects to be served in neat, clean, and orderly surroundings.

Factors Which Offer Maximum Protection

When one considers the multitude of factors that are involved in the safe operation of a public food establishment it is quite difficult to establish a precise priority. In fact, it is necessary to establish priority on some items arbitrarily because epidemiological data on all phases of food service operations are lacking. Equally important is the interrelation between items of sanitary significance. Facilities may be entirely satisfactory yet methods may be poor. Judged in this light, the selection of those factors which give maximum protection must depend upon whatever data is available plus knowledge based upon experience.

There is perhaps no one item more important in a food service operation than the employees. Frequently, this is spoken of as the "human element" and rightly so because every employee from management on down has a responsibility in the operation. The work of each significantly influences the safety and sanitary quality of food service. Here then is one of the first real challenges to a food sanitation program. It is a component which should bring maximum safety to the customer.

Practically all food ordinances contain a section on the health status of employees. A common and familiar one reads as follows:

> "No person who is affected with any disease in a communicable form or is a carrier of such disease shall work in any restaurant, and no restaurant shall employ any such person or any person suspected of being affected with any disease in a communicable form or of being a carrier of such disease. If the restaurant manager suspects that any employee has contracted any disease he shall notify the health officer immediately. A placard containing this section shall be posted in all toilet rooms."

In the past—but to a lesser degree at present—the mandatory medical or physical examination of the food worker was looked upon as an important barrier to the spread of communicable disease and foodborne infections. A good deal of time and effort was expended urging workers to visit a physician or to report to a public clinic for a periodic physical examination. Experience has demonstrated many defects in this procedure, the most serious of which is that the examination seldom discloses conditions presenting the greatest hazard to food. Another well known defect is the false sense of security built up in both the worker and the public. The most serious defect of all is an erroneous assumption made by some public health workers that further inquiry into the status of the food service employee's health is unnecessary because he has undergone a physical examination.

The more productive approach to the food worker, to his health, and to his influence in food safety is through observation, consultation with

management, and education. In an effective food sanitation program the physical condition of all food workers should be carefully scrutinized. General vitality, absence of obvious clinical signs of illness, and condition of skin, particularly of the hands, forearms, neck, and face should be observed. The frequency of respiratory illness, chronic coughing, or a history of recurrent intestinal upsets are of prime significance. It is not expected that the sanitarian will make his inquiry as would a trained physician. Obviously, he should refrain from any attempt at diagnosis. On the other hand, suspicious signs should not be overlooked and careful discussion of the subject worker should be carried on with responsible management. Frequently this will disclose a record of absenteeism on the part of the employee. Management may recall symptoms and days missed because of various complaints of illness by the worker. At this point the sanitarian can render a real service to all parties concerned. He can discuss the most practical and feasible plan for the worker's medical examination with the management. Perhaps there are free diagnostic facilities available in the community to which the worker can be referred. The sanitarian may offer to discuss the worker's situation with the health officer and report back whatever recommendations appear applicable.

The whole subject of employee health is a sensitive and personal one. It must be handled with care, tact, and good judgment. Some may feel that matters of this nature fall into the medical category and that the nonmedical man is not competent to deal with them. The prime answer to this contention is that the sanitarian, not the medical officer, is the person who routinely contacts the food service industry. He has first hand knowledge of each establishment and intimate knowledge of conditions that bear upon the over-all situation. This places him in an advantageous position to make frequent observations in this very significant phase of food service operations. It would appear that all too commonly there is an insufficient amount of careful observation and inquiry made where the food service worker's health status is concerned. A review of food establishment inspection reports covering a large number of places will disclose a wide variety of defects noted in physical surroundings and equipment, but rather infrequently is any notation made concerning employee's health. It is unrealistic to assume that employees are always in a satisfactory state of health. Here is an area where close scrutiny and action, where necessary, offers one important factor in the maximum protection of the public health through the food sanitation activity.

One phase of the complex subject of food sanitation is discussed. The points made form a plea to the food sanitarian to be searching and objective in his inquiry about the employee's health. There is no one perfect solution. Neglect of this priority item in food protection is a serious ommission in an effective public health program. (J.Milk and Food Technology, Special Service Article-Some Essentials of Food Establishment Sanitation, 22:45-47, February 1959)

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Dried Milk Sanitation

Dried milk products are used liberally in Navy messes afloat and ashore because these stable and stowable products lower ration costs and serve as substitutes for depleted supplies of fresh fluid milk at sea.

Dried milk and dried milk products may be erroneously regarded as bacteria-free, sterili foods because of their long shelf life capabilities. In the drying process milk is exposed to temperatures that destroy many bacteria. Even when prepared under the best sanitary codes, however, some bacteria remain unscathed through the drying process and revive after water is added to the dried product.

Although less susceptible to spoilage than its fresh counterpart, reconstituted milk should be subject to the same rigid sanitary practices used in handling the fresh product. Avoid keeping reconstituted dried milk at temperatures ranging from 65 to 115° F. for within this temperature range bacteria will multiply. As man's most nutritious food, milk forms a perfect growth medium for bacteria. For this reason all dried milk reconstituted for beverage use or to be substituted for fluid milk in Navy recipes should not be held for long periods without refrigeration. Powdered ice cream mixes conatin dried milk and also require rigid sanitary precautions.

Equipment and utensils used in the preparation and service of dried milk beverages and ice cream must be kept sanitized in accordance with requirements given in BuMed Instruction 6240.2, Milk and Milk Products; sanitary requirements for use of, dated 23 May 1955; or consult the Manual of Naval Preventive Medicine, Food Service Principles, NavMed P-5010-1, Article 1-24 (4)(d) and (e) and Article 1-25. This Manual states that mixing vats, ice cream freezers, and their gaskets and the cans for the final products must be thoroughly cleaned after each use, rinsed with 180° F. water, and then rinsed again with cold water containing 200 p.p.m. of residual chlorine. A final rinse of 180° F. water must be applied to the utensils before use. The same procedure should be applied to all utensils in which dried milk products are prepared.

The following dried milk products are purchased and used for Navy messes:

MILK, DRY, NONFAT, spray process (5 lb can, 25 lb. can, 25 lb. metal drum, and 50 lb. fiberboard drum)

MILK, DRY, NONFAT, instantized process (1 lb. can and 3 lb. can)

MILK, WHOLE, DRY, spray process (5 lb. can)

MILK PRODUCT, DRY, cocoa flavored (1-1/3 oz. heat sealed envelop)

ICE CREAM MIX, powdered, vanilla (No. 10 can)

These products will keep for long periods if protected from dampness and stowed in a cool dry place. A lumpy appearance of the product designates moisture absorption and is a signal to finish the opened container as soon as possible. Suitable container size for immediate use should be requisitioned, particularly while afloat, to obtain the maximum quality of dried milk products. (Navy Food Service, U.S. Navy Subsistence Office)

Policy

The U. S. Navy Medical News Letter, is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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